

A NEW SPECIES OF *DUSONA* FROM NEW ZEALAND, AND
THE APPLICATION OF *DUSONA* VS. *DELOPIA*
(HYMENOPTERA: ICHNEUMONIDAE, CAMPOPLEGINAE)

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Abstract.—*Dusona destructor* Wahl, a new species of campoplegine Ichneumonidae, is described from New Zealand; *Dusona stramineipes* Cameron is redescribed. The relationships of the two species to each other, and to the rest of the genus, are discussed. Gauld's restriction of *Dusona* to *stramineipes* is rejected and *Delopia* is considered a **junior synonym** of *Dusona*, as is *Kartika*.

Key Words: Ichneumonidae, Campopleginae, *Dusona*, *Delopia*, *Kartika*, systematics

The genus *Dusona*, as recognized by Townes (1970) and numerous other authors, is a very large genus of campoplegine Ichneumonidae with a worldwide distribution. Gauld, in his comprehensive revision of Australian ichneumonid genera (1984, hereafter referred to as "Gauld"), restricted *Dusona* to the New Zealand species *stramineipes* Cameron and referred the other species previously under that name to *Delopia*. I recently found a new species closely related to *stramineipes*, also from New Zealand, in the American Entomological Institute collection. Evaluation of the two species led me to re-examine Gauld's actions concerning *Dusona* and *Delopia*. I herein characterize the group to which the New Zealand species belong, redescribe *stramineipes* and describe *destructor* new species, and discuss *Dusona* and its relationship to other genera.

MATERIALS AND TERMINOLOGY

Specimens for this study were borrowed from or deposited in the following collections: American Entomological Institute (AEIC): Gainesville, Florida (H. Townes); Natural History Museum (BMNH): Lon-

don (M. Fitton). I am indebted to the curators.

The morphological terminology is mostly that of Townes (1969), with modifications as given in Wahl (1987, 1989). When the laterotergite of tergite 3 is not separated from the tergite by a horizontal crease, I refer to it as "pendant." Intermediate conditions are found in which a crease is present basally but the remainder of the laterotergite cannot be distinguished from the tergite.

The *stramineipes* species group

Gauld cited a number of autapomorphies for *stramineipes*: vein 1cu-a slightly proximal to 1-Rs, mesopleurum with a transverse groove extending from the epicnemial carina to the scrobe, petiole of metasomal segment 1 without any trace of carinae on the dorso-lateral corners, and the posterior margin of the hypopygium with a median incision. He also mentioned, but did not characterize as autapomorphic, the decurved ovipositor and finely pectinate tarsal claws. Discovery of *destructor* allows a new perspective on these characters. The mesopleural carina is weak in *destructor*, no stronger than in most other campoplegines,

in which there is usually some sort of weak transverse depression in this area. Both *stramineipes* and *destructor* share the finely pectinate tarsal claws, lack of petiolar carinae, hypopygial incision, and decurved ovipositor. The decurved ovipositor is found in scattered species of *Delopia*, but the remaining characters appear to be synapomorphies for these two species. They constitute a distinct species group.

Dusona stramineipes Cameron

Dusona stramineipes Cameron 1900: 177.

Type: ♀ [BMNH]; examined in 1990.

Degithina strammeipes (!) Hudson, 1920: 223. Host: *Xyridacma alectoria* (taxonomy, biology).

Dusona stramineipes Gourlay, 1930: 5. Host: *X. alectoria* (biology).

Dusona stramineipes Hudson, 1951: 56. Host: *Xyridacma hemipteraria* (biology).

Dusona stramineipes Townes, Townes, and Gupta, 1961: 232 (taxonomy).

Dusona stramineipes Gauld, 1984: 269 (taxonomy).

Diagnosis.—Distinguished from *destructor* by: metapleurum strongly convex, centrally impunctate or with weak punctures, surface sculpture varying from nearly smooth to granulate with weak, fine rugae; fore coxa with basal 0.7–0.8, middle coxa except for extreme apex, black; hind femur $5.7\text{--}6.2\times$ as long as deep.

Female. Structure: 1. Mesopleural punctures separated by $0.5\text{--}1.0\times$ their diameter on nearly smooth to moderately granulate surface. 2. Scrobal groove with moderately well-developed, fine transverse rugae. 3. Mesopleurum with distinct transverse groove extending from epinomial carina to scrobe. 4. Metapleurum strongly convex, centrally impunctate or with punctures weak and separated by $1\text{--}2\times$ their diameter, surface sculpture varying from nearly smooth to granulate with weak, fine rugae. 5. Hind femur $5.7\text{--}6.2\times$ as long as deep. 6. Areolet size small (Fig. 1) to moderate (Fig. 2). Col-

or: Head and mesosoma black, the following yellow: mandible varying from entirely, except for dark brown apex, to only apical 0.5 except for dark brown apex; apical 0.2–0.3 of fore coxa and remainder of fore leg except for brownish yellow of tarsomeres; extreme apex of middle coxa and remainder of middle leg; central 0.5 of hind tibia and tibial spurs. Remainder of hind leg fuscous. Metasoma fuscous with brownish red tints on lateral aspects of tergites 3–7. *Length:* 6.8–8.2 mm (7.6 mm); fore wing 4.9–5.9 mm (5.4 mm).

Specimens examined.—♀ holotype, 5 labels: “12m [handwritten]”; “Type [red border]”; “Cameron coll./1902-289.”; “*Dusona/stramineipes/Cam. type/New Zealand* [all handwritten]”; “B.M TYPE/HYM/3B.1781 [handwritten]”; (BMNH). Condition of type: intact except right antenna broken beyond flagellomere 4, tarsomeres 3–5 of right hind leg missing, and wing with minor tears. Other specimens. NEW ZEALAND: Manapouri, “10-2-19,” [1 ♀, AEIC]; Palmerston North, “on eucalypt—mating,” “Forest Research Institute/Rotorua New Zealand/716,” M. A. Stoodley [1 ♀, AEIC].

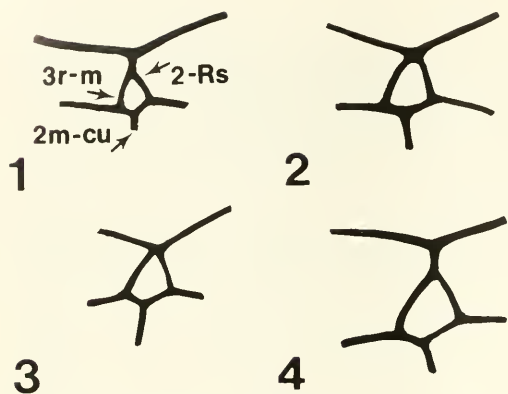
Comment.—The Museum of Natural History has two specimens, a female and a male, identified as *Dusona stramineipes* Cameron, and each has a red-bordered “Type” label. I am treating the female as the holotype. Cameron’s description refers only to the female sex, with no indication that he examined a male. The male specimen actually belongs to *destructor*, and I am making it a paratype of that species.

Expression of the sternotergal suture of the petiole is variable, ranging from almost absent in the Palmerston North specimen to present but weak in the holotype.

The species has been reared from Geometridae (Lepidoptera).

Dusona destructor Wahl, NEW SPECIES

Diagnosis.—Distinguished from *stramineipes* by: metapleurum weakly convex,



Figs. 1-4. Areolets of *Dusona* spp. 1. *D. stramineipes* (Palmerston North specimen). 2. *D. stramineipes* (Manapouri specimen). 3. *D. destructor* (holotype). 4. *Dusona* sp. (Guatemala, AEIC).

surface densely punctate and transversely striate; fore and middle coxae entirely yellow; hind femur about $5.2\times$ as long as deep.

Female. Structure: 1. Mesopleural punctures separated by $0.2\text{--}0.5\times$ their diameter (most nearer the former value) on moderately to strongly granulate surface. 2. Scrobal groove with weak transverse rugae. 3. Mesopleurum with weak transverse impression extending from epicnemial carina to scrobe. 4. Metapleurum weakly convex, surface densely punctate and transversely striate. 5. Hind femur about $5.2\times$ as long as deep. 6. Areolet size moderate (Fig. 3). **Color:** Head and mesosoma black, the following yellow: ventral surface of scape, mandible except for dark brown apex, tegula, fore and middle legs except for dark brown of apical 0.5 of basitarsus and remaining tarsomeres, posterior surface of hind trochantellus, hind tibia except for dark brown of basal 0.1 and apical 0.33, hind tibial spurs. Remainder of hind leg dark brown-fuscos. Metasoma fuscos with brownish red tints on lateral aspects of tergites 3-7. **Length:** 12.2 mm; fore wing 7.9 mm.

Male. Similar to female except mesopleurum weakly granulate; most of hind trochantellus, and extreme base of hind femur,

brownish yellow. **Length:** 7.1 mm; fore wing 4.4 mm.

Type material.—Holotype ♀, NEW ZEALAND: Rotorua, 15 Feb. 1971, J. Bain, "Malaise trap" [AEIC]. Condition of type: intact except right antenna broken beyond flagellomere 24. Paratype ♂, 6 labels: "12m [handwritten, turned over]"; "12 [handwritten, turned over]"; "Type [red border]"; "Cameron coll./1902-261."; "Dusona/stramineipes/Cam. type/New Zealand [all handwritten]"; "B.M TYPE/HYM/3B.1782 [handwritten]"; (BMNH).

Etymology.—From the Latin for "destroyer," in reference to its role in destroying a beautiful hypothesis. It is a noun in apposition.

DISCUSSION

Gauld restricted *Dusona* to *stramineipes*, leaving the rest of this very large, worldwide genus to be known as *Delopia*. Gauld argued that *stramineipes* is the sister-group to *Delopia* + *Kartika*. *Kartika* was proposed by Gupta and Gupta (1976) for species with the laterotergite of tergite 3 separated by a distinct crease. Synapomorphies for *Delopia* + *Kartika* were stated by Gauld to be: a) a large areolet, b) short and deep tergite 3, and c) no trace of the sternotergal suture of metasomal segment 1. These characters do not hold up when outgroups or the world fauna (including *destructor*) are taken into account. First, the sister-group to all of the above taxa is *Urvashia* (Gupta and Gupta 1971). Synapomorphies grouping these taxa are: 1) inner margin of the eye sharply notched opposite the antennal socket, 2) a large areolet, 3) propodeum laterally angulate, 4) apex of propodeum prolonged between the hind coxae, 5) metasomal segment 1 elongate with the glymma reduced, and 6) ovipositor about as long as apical metasomal depth. *Kartika*, *Delopia*, *destructor*, and *stramineipes* are united by the following synapomorphies: 7) elongate propodeal spiracle, 8) loss of the lateral longitudinal carinae of the propodeum, 9) fusion

of the tergite and sternite of metasomal segment 1 so that at most only an impressed groove is present, and 10) a more or less strongly laterally compressed metasoma. Given these relationships (Fig. 5), the large areolet of *Delopia* (Fig. 4) is plesiomorphic and the small-moderate areolet (Figs. 1–3) of *stramineipes* and *destructor* is a reversal. *Kartika* has a range of areolet sizes, from large to small; I assume the latter represent reversals as well. I found no detectable differences in tergite 3 dimensions between *Kartika* and *stramineipes*. While tergite 3 is shorter and deeper in many *Delopia*, this is due to the pendant laterotergite. As to the tergo-sternal suture, numerous species of *Kartika* and *Delopia* have an impressed groove and lack of such a groove cannot be used to define *Delopia*.

The synapomorphies used by Gauld fail to demonstrate a sister-group relationship between *stramineipes* (+ *destructor*) and *Delopia* + *Kartika*. There is no doubt that *stramineipes* and *destructor* represent a distinct species group. Is *Delopia* a valid genus, i.e. monophyletic? The only remaining autapomorphies given by Gauld are the position of vein 1cu-a distad of vein 1-Rs by 0.2 or more the former's length, and the pendant laterotergite of tergite 3. *Urvashia* has 1cu-a distad and the vein's position is variable in *Delopia*, ranging from almost opposite 1-Rs to distad. The situation is confusing, but the distad position is probably plesiomorphic for *Delopia*. As for tergite 3, the separated condition is plesiomorphic for campoplegines and the family. *Delopia* species exhibiting the range of variation from separated to pendant can be found in every biogeographic region. This brings up the question of the status of *Kartika*. Gupta and Gupta (1976) discuss a number of characters differentiating *Kartika* from *Dusona* (as used by Townes), but the critical one is *Kartika*'s possession of a completely separated laterotergite. *Dusona* was said to have the laterotergite always pendant. Gupta and Gupta (1978) later not-

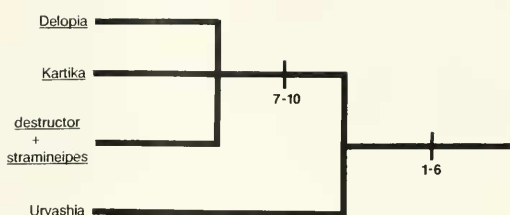


Fig. 5. Cladogram for *Urvashia*, *stramineipes* group, *Kartika*, and *Delopia*.

ed that intermediates existed but left the problem for future study. Since a separated laterotergite is plesiomorphic, *Kartika* clearly does not represent a monophyletic group. Whether it is paraphyletic or polyphyletic must await detailed study of the world fauna. My conclusions are: a) *stramineipes* and *destructor* are a monophyletic taxon, the *stramineipes* species group; b) *Delopia* is not a demonstrably monophyletic taxon with respect to the *stramineipes* group (*Dusona*, as used by Gauld); c) *Kartika* is not supported by autapomorphies; d) *Delopia* is a junior synonym of *Dusona* (as used by Townes), as is *Kartika* (NEW SYNONYM). Finally, examination of the mature larva of *Dusona leptogaster* (Holmgren), a species with a completely separated laterotergite, reveals the same derived type of labial sclerite found in species with a pendant laterotergite: it is about $1.4\times$ as long as wide, and the ventral portion is $0.4\text{--}0.5\times$ as long as the length of the sclerite.

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